PATENT APPLICATION
Atty Docket: <u>678-711 (P9667)</u>

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):   KIM, Sung-Jin   **Examiner:** PHAN, Tuan

SERIAL NO.:   09/992,934   **Group Art Unit:** 2643

FILED: November 5, 2001

FOR: **METHOD OF INFORMATION SHARING BETWEEN CELLULAR AND LOCAL WIRELESS COMMUNICATION SYSTEMS**

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

<u>37 C.F.R. § 1.131 DECLARATION OF PRIOR INVENTION MADE IN THE REPUBLIC OF KOREA TO OVERCOME CITED PATENT PUBLICATION</u>

Sir:

I, Sung-Jin KIM, hereby declare that:

1. I am an inventor for the above-referenced patent application, which claims priority to application numbers 2000-71023 and 2001-20653 that were filed with the Korean Industrial Property Office on November 27, 2000 and April 18, 2001, respectively.

2. This declaration is submitted to establish reduction to practice of the invention of the above-referenced patent application in the Republic of Korea prior to September 29, 2000, which is the effective filing date of U.S. Patent No. 6,748,195, which was issued to *Philips*, and also prior to the effective filing date of U.S. Patent 6,748,195, which was

issued to Watanabe, and further prior to the effective filing date of U.S. Publication

2003/0021262, which was filed by Ma et al., and each of which was cited by the

Examiner in the above-referenced patent application.

3. This declaration is submitted prior to issuance of a final rejection in the above-referenced

patent application.

4. To establish the date of reduction to practice of the invention of the above-referenced

patent application, the following documents are attached hereto and are submitted as

evidence:

    a. Exhibit A is an invention disclosure document;

    b. Exhibit B is a certified translation of Exhibit A;

    c. Exhibit C is a certified translation of application number 2000-71023 that was

       filed with the Korean Industrial Property Office on November 27, 2000; and

    d. Exhibit D is a certified translation of application number 2001-20653 that was

       filed with the Korean Industrial Property Office on April 18, 2001.

5. The invention disclosure document provided as Exhibit A hereto was completed at least

before September 29, 2000, which is earlier than the effective filing dates of *Philips,*

Wantabe and Ma et al.

6. The invention disclosure document and the translation thereof, provided as Exhibits A

and B, respectively, to this Declaration show a reduction to practice of the invention

claimed in the above-referenced patent application.

7. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statement may jeopardize the validity of the application or any patent issuing thereon.

Date: _/8/01/2006_

Sung-Jin KIM
<u>Sung-Jin KIM</u>

Country of Citizenship: <u>Republic of Korea</u>

Residence Post Office Address: <u>997-1, Taejeon-dong, Buk-gu, Daegukwangyeok-shi, Republic of Korea</u>

⊕ 직무발명신고

<<특허법 제39조 제40조 규정에 의거 직무와 관련된 본발명에 대해 등록받을 수 있는 권리를 회사에 양도합니다>>

∷ 본 직무발명은 통신연구소 지적자산팀(수원/구미)으로 접수됩니다.

∷ 발명명칭   Bluetooth CDMA 휴대폰에서 블루투스를 단말기간의

∷ 과제명   Bluetoth CDMA   ∷ 과제코드   DF014   ∷ 제품명   Bluetooh 복합단말기

∷ 핵심기술(코드)명칭   )

∷ 기술적 내용의 평가

구분	평가내용		
발명구분	◉ 자체발명 ◉ 산학협동 ◉ 용역개발 ◉ 공동개발		
계약서관리	[계약서 첨부]		
	파일명		파일설명
	[소유권. 보상문제 기재]		
공표사실	공표예정일 -	공표국가 및 단체 -	공표방법 -

∷ 발명자인적사항

No.	사외	이름	소속부서(기관)명	대표	지분(%)	영문성명	한자성명
			주민번호		주소 (집)		
1		김성진	개발3그룹(무선)	◉	100	KIM SUNG JIN	金聖眞
			710309-*******	대구광역시 북구 태전동 997-1 에덴타운 102동 1003호			

∷ 직무발명신고파일

파일명	파일설명
BT_SMS전송.gui	블루투스 단말기을 향한 정보 공유 및 재전송 특허
직무發명신고서	

∷ 발명등급판정

판정주체		판정일자	등급	의견
발명자	김성진	2000/08/22	B급	블루투스 단말기에서 부가기능의 특허
부서장	김동우	2000/08/22	B급	-
특허부서		2000/08/28	B급	전산일괄입력
평가위원회		2000/11/21	A급	전산일괄입력

∷ 직무발명 진행일자 관리

발명자상신일	2000/08/22	부서장승인일	2000/08/22	특허부서접수일	2000/08/23

∷ 직무발명 접수번호   : GW-200008-004-1

SAMSUNG 삼성전자

직무발명(고안)명세서 (Invention Disclosure)	【사전체크 사항】
● 발명의 명칭 (Title of Invention) ※ 발명(고안)의 내용을 표현할 수 있는 명칭을 간단 명료하게 기재	○선출원주의이므로 신속출원이 필요함 ○완성된 발명이어야 함

국 문	Bluetooth CDMA 휴대폰에서 블루투스를 단말기간의 메세지 재전송기능	- 실시예, Data등의 뒷받침이 필요 - 미완성 또는 희망사항 불가
영 문	Forwarding Message in Bluetooth CDMA PHONE to Bluetooth Terminals	○출원전에 공표 금지 - 학회,논문,판매,전시 금지

●관련 선행 기술 및 선출원 — 본 발명과 관련이 있는 기술이 이미 출원되어 있거나 현재 진행중인 것을 모두 기재함.
- 국내우선권 주장이 목적이며, 최초 출원일로 부터 1년이내에는 개량출원이 가능함.

[기술출처] (해당 부분만 선택 기재)	유사 특허 또는 출원	출원/등록번호		출원/등록일자	
		발명의 명칭			
		출 원 인			
	배경 문헌 또는 제품	문헌명/제품모델명		발표자/제조사	
		발표/제조 년월일		페이지/기타	
	발명(고안)과 관련된 발명자 의 선출원	既 출원 건	발명의 명칭		
			출원번호/일자	(19 . . .)	
		진행중인 건	발명의 명칭		
			접수번호/일자	(19 . . .)	

1. 발명의 배경

가. 본 발명의 기술분야

기존 이동통신 서비스 에서 단말기에 수신된 메세지 및 개인 작성 메세지의 블루투스 단말기간 재전송알고리즘 및 수신 기능분야. 혹은 기존 이동통신 시스템 으로부터 받은 정보의 네트웍화를 통한 공유 실현 가능.

나. 종래기술의 설명 및 그 문제점

블루투스 기능에서 MASTER에서 SLAVE로의 정보공유를 위한 메세지 전송기술은 있으나 일반 휴대폰에서 즉 기존 이동통신 서비스를 받고 있는 단말기가 받은 SMS 메세지의 재 전송기능 및 편집기능은 없다. 따라서 단말기가 가지고 있는 모든 정보의 재전송가능 하는 기술.

다. 종래기술 문제점의 해결방법 및 본 발명의 목적
 - 종래기술의 문제점
  블루투스 단말기간의 파일전송 및 방송메세지는 전송할수 있으나.
  실제 이동통신 서비에서 받은 메세지나 개인작성 메세지의 편집 및
  재전송 할수 없고 정보공유 불가능. 즉 정보의 네트웍화 불가.

 - 본 발명의 목적
   위 문제점에 있어서 블루투스 프로토콜로 통신하는 MASTER와
  SLAVE간 정보 공유에 목적이 있다. 정보의 블루투스 기반의
  네트웍화 구현

2.발명(고안)의 구체적 설명
 가.발명의 구성
   블루투스 단말기 MASTER와 여러개의 블루투스 단말기 SLAVE로 구성된
  네트웍상에서 MASTER는 기존 이동통신 시스템의 서비스를 지원 받거나.
  인터넷의 정보서비스를 받을수 있는 것으로 구성한다. 이때 데이터를
  표시하는 LCD, 입력장치 KEY등도 함께 구성한다.

나. 발명의 동작설명

　　MASTER에서 수신된 메세지는 사용자의 원하는 시점에 원하는 정보로 편집 및 추가되어
SLAVE단말기에 전송되는 기술이다. 이를 위해서는 MASTER의 메모리에 저장된 데이터를
CPU에서 처리하여 LCD에 표시하여 이를 수정하고 다시 송신하는 알고리즘으로 동작한다.
이런 알고리즘으로 가능한 기능으로는 이동통신 시스템에서 수신된　메세지의 재전송기능
, 개인적인 쪽지전달, 자체메세지 작성기능을 구분되어 동작한다.

다. 발명의 효과

　　블루투스 네트웍에서 하위 단말기로의 정보 공유 및 이동통신 시스템으로 부터의 정보
공유를 효과적이고 빠른속도 재전송할수 있다.

3. 권리청구의 범위
　　블루투스 네트웍에서 개인작성 메세지 전송 및 현재 서비스 중인 사업자에서
받은 메세지의 블루투스 프로토콜로 전환하여 각 하위 단말기로 정보공유하는
재전송 기능이 이특허 청구 범위이다.

○ 특허발명과 기술범위를 결정하는 매우 중요한 항목임 (※ 설명부분이 필요없을시 삭제가능)

  - 독점권을 얻고싶은 특징사항만을 기술한다.

  - 본 발명의 특징과 같은 효과를 얻기위해서 필요한 신규의 구성요소를 기술한다.

【 기재 예 】

1. 상위개념(독립항)

  - ＸＸＸ기능을 하는 A와 ＹＹＹ기능을 하는 B로 구성된 ○○장치(회로)

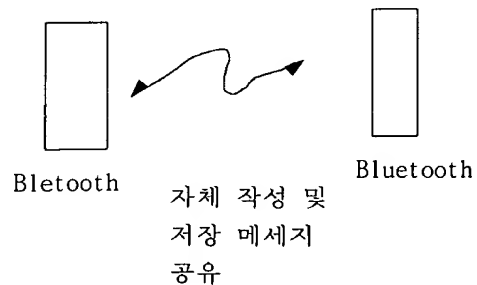 - A단계와 B단계와 C단계로 이루어지는 ○○방법

2. 하위개념(종속항)

  - 제1항(독립항인용)에 있어서 동신호. 검출부(수단)는 --하는 --와, --하는 --로 구성된 ○○장치(회로)

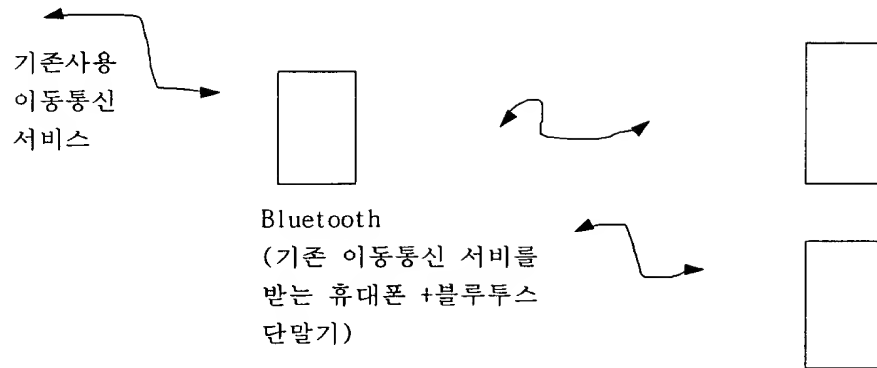 - 제1항(독립항인용)에 있어서 A단계의 접속이 ○○인 ○○방법

3. 상위개념(독립항)

  - - - - - - - - - - -

  - - - - - - - - - -

4. 도 면

1. 발명의 특징을 가장 잘 나타낼 수 있는 것을 대표도로 하며, 발명의 구체적 설명에서
    인용할 부호와 도면 상의 부호를 일치시켜 기입한다.
2. 도면에 대한 간단한 설명을 도면아래 기입한다. (※ 설명부분이 필요없을시 삭제가능)

가. 종래기술의 도면

Bletooth

자체 작성 및
저장 메세지
공유

Bluetooth

나.본 발명의 도면

기존사용
이동통신
서비스

Bluetooth
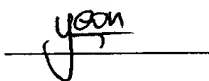(기존 이동통신 서비를
받는 휴대폰 +블루투스
단말기)

CERTIFICATION FOR TRANSLATION

As a below named translator, I hereby declare that my residence and citizenship are as stated below next to my name and I hereby certify that I am conversant with both the English and Korean languages and the document enclosed herewith is a true English translation of Korean language invention disclosure, which the translation is accurate.

NAME OF THE TRANSLATOR : Yeon-Ji KIM

SIGNATURE :

RESIDENCE : MIHWA BLDG., 110-2, MYONGRYUN-DONG 4-GA, CHONGRO-GU, SEOUL 110-524, KOREA

CITIZENSHIP : REPUBLIC OF KOREA

♦ Invention disclosure

<<Rights, which can be registered with respect to the present invention relating to the jobs of employees, are granted to an employees' corporation under the regulation of articles 39 and 40 of the patent law >>.

◙ The present employee invention is received to the intellectual property team of the telecommunication institute (Suwon city and Gumi city).

◙ Title of the present invention : "Method for Forwarding Message in Bluetooth CDMA phone to Bluetooth terminals"

◙ Evaluation of technical contents

Items	Evaluated Contents		
Type of Invention	● individual invention ○ industry-university cooperation ○ outside development ○ corporative development		
Contract Management	[Contract Attachment]		
	The name of File	The description of File	
	[inscription of a property right and description about compensation problems]		
Disclosed Particulars	Due date of disclosure	Disclosed country and organization	Disclosure type

◙ Identification of inventors

Inventor's name	Inventor's Resident Number	Representative	Inventor's address
Kim Sung Jin	710309-******	representative	102-1003, Eden-Tower, Taejeon-dong, 997-1, Buk-gu Taegu, Republic of Korea

◙ File of employee invention report

Name of File	Description of File
BT_SMS transmission, gul	Patent regarding forwarding information to Bluetooth terminals and information share
Employee invention report	

◙ Judgment of invention grade

Subjects of Judgment	Date of Judgment	Grade	Opinion

1

Inventor	Kim Sung Jin	2000/08/22	B	Patent regarding additional functions of a Bluetooth terminal
Chief of inventor	Kim Dong Woo	2000/08/22	B	-
Patent Team		2000/08/28	B	Computer input
Evaluation committee		2000/11/21	A	Computer input

◙ Dates regarding employee invention

Date of Inventor Report	2000/08/22	Approval Date of Team Leader	2000/08/22	Receipt Date of Patent Team	2000/08/23

◙ Receipt number of employee invention : GW-200008-004-1

METHOD FOR FORWARDING MESSAGE IN BLUETOOTH CDMA PHONE TO BLUETOOTH TERMINALS

5 ## 1. BACKGROUND OF THE INVENTION

a) Field of the Invention

The present invention relates to a method for forwarding and receiving a message, which is received in a terminal, and an individually written message

10 between Bluetooth terminals in the conventional mobile communication service, and more particularly to share of information received from the conventional mobile communication system through an information network.

b) Description of the Related Art & Problems thereof

15 Although Bluetooth functions enable message transmission for information share from a master to a slave, the Bluetooth functions have neither a retransmission function nor an editing function of an SMS message received by a typical mobile phone, that is, a terminal having benefited the conventional mobile communication service . Accordingly, a technique for forwarding all

20 pieces of information belonging to the terminal is required.

c) Solution to the Problems of the Prior Art & Object of the Present Invention

-. Problems of the Prior Art

25 Although Bluetooth terminals can transmit files and broadcasting messages therebetween, the Bluetooth terminals cannot actually edit and forward messages received from a mobile communication server and share information with the mobile communication server. In other words, it is difficult to construct an information network.

30

-Object of the present invention

The object of the present invention is to share information between a MASTER and a SLAVE making communication based on a Blueetooth protocol.

Another object of the present invention is to construct an information
5 network based on Bluetooth.

2. DETAILED DESCRIPTION OF THE INVENTION

a) Construction of the Present Invention

10 According to the present invention, a master is constructed in such a manner that the master can receive a service of the conventional mobile communication system and Internet information service on a network including the master (which is a Bluetooth terminal) and a plurality of slaves (which are a plurality of Bluetooth terminals). In this case, the master includes an LCD for
15 displaying data and keys, which are included in an input device.

b) Operation of the Present Invention

The present invention suggests a technique in which a message received in a master is edited into desired information and inserted so as to be transmitted to a slave terminal at a time point desired by a user. To this end, the master
20 operates through an algorithm in which a central process unit processes data stored in a memory of the master, displays the data on an LCD, modifies the data, and forwards the data. Functions based on the algorithm are classified into a retransmission function of a message received in a mobile communication system, a function of delivering an individual tag, and a function of writing a
25 self-message.

c) Effect of the Present Invention

It is possible to share information with a lower-level terminal and a mobile communication system and effectively and quickly forward information
30 to the lower-level terminal and the mobile communication system.
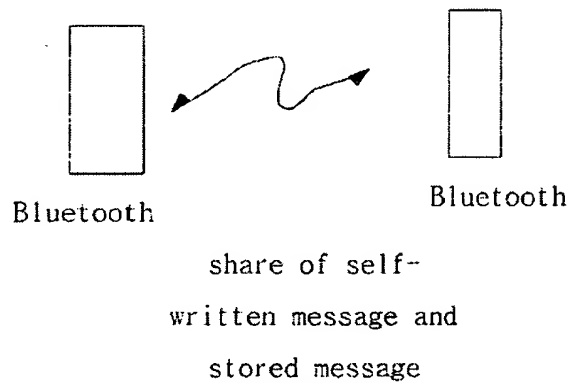
3. CLAIMS

[1]   A method for forwarding information to a lower-level terminal by
5 converting an individually written message and a message received from a
service provider, who are providing a service, to Bluetooth protocol messages in
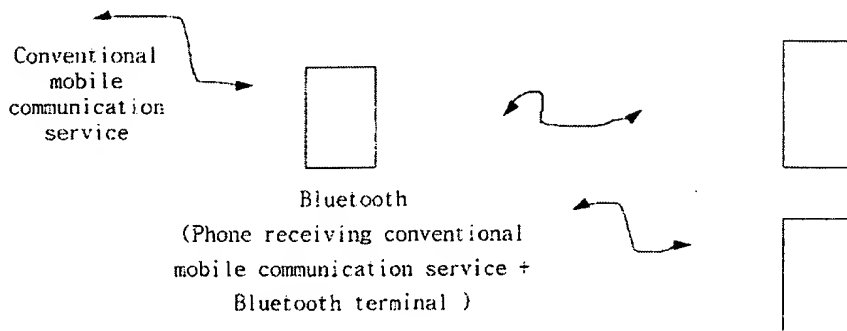a Bluetooth network

4. DRAWINGS

10

A. PRIOR ART DRAWINGS

Bluetooth   Bluetooth

share of self-

written message and

stored message

B. DRAWINGS OF THE PRESENT INVENTION

15

Conventional
mobile
communication
service

Bluetooth
(Phone receiving conventional
mobile communication service +
Bluetooth terminal)

CERTIFICATION FOR TRANSLATION

As a below named translator, I hereby declare that my residence and citizenship are as stated below next to my name and I hereby certify that I am conversant with both the English and Korean languages and the document enclosed herewith is a true English translation of a priority document with respect to the Korean patent application No. **71023/2000** filed on **November 27, 2000.**

NAME OF THE TRANSLATOR : Yeon-Ji KIM

SIGNATURE : _Yeon_   **Date** : February 28, 2001

RESIDENCE : MIHWA BLDG., 110-2, MYONGRYUN-DONG 4-GA, CHONGRO-GU, SEOUL 110-524, KOREA

CITIZENSHIP : REPUBLIC OF KOREA

[ABSTRACT OF THE DISCLOSUSRE]

[ABSTRACT]

Disclosed is an information sharing method by Bluetooth wireless communication. To share information with a slave by Bluetooth wireless communication, a portable phone connected with the slave through Bluetooth wireless communication and equipped with a Bluetooth module as a master receives service information from a mobile communication system and stores the received service information. The portable phone determines whether to transmit the service information to the slave by Bluetooth wireless communication. The portable phone converts data packets of the service information to Host Control Interface (HCI) packets and transmits the HCI packets to the slave.

[REPRESENTATIVE FIGURE]

FIGURE 4

[INDEX]

Bluetooth, Master, Slave

[SPECIFICATION]

[TITLE OF THE INVENTION]

METHOD OF SHARING INFORMATION BY BLUETOOTH
5   WIRELESS COMMUNICATION

[BRIEF DESCRIPTION OF THE DRAWINGS]

FIG. 1 illustrates the network configuration of a Bluetooth system to which the present invention is applied.

10   FIG. 2 illustrates a Bluetooth system receiving mobile communication services according to an embodiment of the present invention.

FIG. 3 is a block diagram of a mobile phone having a Bluetooth module according to the embodiment of the present invention.

FIG. 4 is a flowchart illustrating a control operation for providing mobile
15   communication services to a Bluetooth device according to the present invention.

[DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT]
[OBJECT OF THE INVENTION]
[RELATED FIELD AND PRIOR ART OF THE INVENTION]

20   The present invention relates generally to a Bluetooth terminal, and in particular, to a Bluetooth terminal receiving mobile communication service.

Bluetooth is a global de facto standard for wireless connectivity between mobile devices such as portable PCs and mobile phones.   Based on a low-cost,

short-range radio link, Bluetooth cuts the cords that used to tie up digital devices to communicate voice and data. For example, a Bluetooth equipped mobile phone and laptop can establish a wireless connection together. Bluetooth is likely to be standard in PDAs (Personal Digital Assistants), desktops, facsimiles,

5   keyboards, joysticks and a whole range of other digital devices.

As shown in FIG. 1, a Bluetooth system supports a point-to-point or point-to-multipoint connection. A set of devices sharing a channel should also share capacity. This device set is called a piconet. The piconet is defined as a

10   small ad hoc network created when two or more Bluetooth-compatible devices recognize and communicate with each other. Seven Bluetooth units form a piconet with one unit acting as a master and the others acting as slaves. The master manages the piconet including generation of a frequency hopping pattern.

15   When no connection is established between Bluetooth units, this is called a standby state. In the standby state, each Bluetooth unit receives a new message every 1.28sec. Upon receipt of a connection request, a Bluetooth unit becomes a master and then starts to recognize other Bluetooth units. Bluetooth units, assigned to 8-bit park addresses, are in a park state. Bluetooth units

20   communicating with the master, if they receive 3-bit active addresses, form a piconet. Among eight addresses representable with three bits, one is used as a broadcasting address and the other addresses are assigned to seven Bluetooth units. Thus, seven Bluetooth units form a piconet. The Bluetooth units in the active state can be divided into three modes: active mode, hold mode, and sniff

mode (lower power than in the active mode). Bluetooth units in the hold mode and the sniff mode participate in forming the piconet but have no influence on the total traffic. The master transmits an inquiry including a link key at every 625μs intervals and synchronizes with slaves within two seconds. The slaves

5 are assigned to 3-bit active addresses and after receiving a page message from the master, they are synchronized with the master using a hopping pattern determined by the master. Then, an authentication process follows. An encryption key for authentication is formed by XOR-gating a random number generated from the master the MAC address of a slave. After the authentication,

10 a data transmission state is entered.

The master controls all traffic on a channel. A plurality of independent and asynchronous piconets form a scatternet. Users of each piconet has a 1-MHz hop channel in the scatter net. Because the 1-MHz channel is not shared

15 with other piconet units, the total throughput is increased as a piconet is added. In the scatternet, a Bluetooth unit can be act as a slave in one piconet and as a master in another piconet.

[SUBSTANTIAL MATTER OF THE INVENTION]

20 While there exists message transmission technology for information sharing from a master to slaves in the Bluetooth function, a general mobile phone, that is, a terminal receiving a mobile communication service cannot retransmit, for example, an SMS message. In other words, information can be shared between Bluetooth terminals, but it is impossible to retransmit a message for a

mobile communication service.

It is, therefore, an object of the present invention to provide a method of exchanging information received from a mobile communication system between

5 Bluetooth terminals.

[CONSTRUCTION AND OPERATION OF THE INVENTION]

To achieve the above and other objects, there is provided an information sharing method by Bluetooth wireless communication. To share information

10 with a slave by Bluetooth wireless communication, a portable phone equipped with a Bluetooth module as a master receives service information from a mobile communication system and stores the received service information. The portable phone determines whether to transmit the service information to the slave by Bluetooth wireless communication. The portable phone converts data

15 packets of the service information to Host Control Interface (HCI) packets and transmits the HCI packets to the slave.

A preferred embodiment of the present invention will be described herein below with reference to the accompanying drawings. In the following description,

20 well-known functions or constructions are not described in detail since they would obscure the invention in unnecessary detail.

FIG. 2 illustrates a Bluetooth system receiving mobile communication services according to an embodiment of the present invention. While a CDMA

system is described as a mobile communication system, it is obvious to those skilled in the art that the present invention is also applicable to other communication systems including GSM.

5   Referring to FIG. 2, an SMSC (Short Message Service Center) 150 is an independent node connected between an HLR (Home Location Register) 140 and an MSC (Mobile Switching Center) 130, for locating a receiver and transmitting SMS messages to mobile subscribers through the PLMN (Public Land Mobile Network). The SMSC 150 exchanges digits and characters between multiple
10   character transmission systems including a PC communication system, an Internet server system, and mobile phones and subscriber. The SMSC 150 is connected to another network through an SMC (Short Message Client: not shown).

15   The MSC 130 interacts with another MSC to process a call origination/termination request from a mobile phone 100. The MSC 130 refers to the HLR 140 for information about subscribers and, when an SMS message is received from the SMSC 150, it transmits the SMS message to a BSC (Base Station Controller) 120 so that the SMS message can be transmitted through a
20   BTS (Base Transceiver Station) 110 via a paging channel. Message reception is performed in the reverse order in the same manner. The HLR 140 is a medium-level computer mainly processing subscriber information. The HLR 140 is largely divided into a network connection device, a subscriber database, and an operation management device. The BSC 120 (or 160) controls a wireless link

and a wired link and performs a handoff not to interrupt a call for a subscriber while he is roaming. The BTS 110 (or 170) communicates wirelessly with the mobile phone 30.

5   The mobile phone 100 acts as a master in a Bluetooth piconet and exchanges SMS messages or Internet data. As stated before, the mobile phone 100 can be at once a master in one piconet and a slave in another piconet. A master controls all traffic on a channel and secures slots to assign capacity to an SCO (Synchronous Connection-Oriented) link. Only when its AMC address is

10 set in a master-to-slave slot, a slave can transmit in a slave-to-master slot. A master-to-slave packet selects a slave. That is, a traffic packet transmitted to one slave automatically another slave. If the master has no information to a slave, it cannot use a packet selecting a slave. This packet is comprised of an access code and a header. This central polling scheme removes contention

15 between slave transmissions.

FIG. 3 is a block diagram of a mobile phone with a Bluetooth module according to the embodiment of the present invention.

20   Referring to FIG. 5, a Bluetooth module 10 includes an RF (Radio Frequency) transmitter 11, an RF receiver 12, a baseband processor 13, and a link controller 14. The baseband processor 13 and the link controller 14 are connected to a mobile phone controller 21 via an HCI (Host Control Interface), for exchanging control commands and user data in HCI packets. The HCI may

be RS232C, Universal Serial Bus (USB), or a standard PC interface and the HCI packets include command, event, and data packets.

The RF transmitter 11 modulates radio data received from the baseband processor 13 in a particular frequency band and amplifies the modulated signal prior to transmission.

The RF receiver 12 receives an RF signal, amplifies a signal in a predetermined frequency band while suppressing amplification of the noise of the frequency signal, and downconverts the frequency of the amplified signal to a base band.

The baseband processor 13 converts a data packet received from the controller 21 to a packet suitable for Bluetooth communication by adding an access code and a header to the HCI data packets, converts the Bluetooth packet to a predetermined data packet for wireless communication, and transmits the data packet in a predetermined frequency band through the RF transmitter 11. The baseband processor 13 also converts a data packet received from the RF receiver 12 to an HCI packet and feeds the HCI packet to the controller 21.

The link controller 14 controls the Bluetooth module 10 based on a command packet received from the controller 21 and transmits a request from a master and result information received from the baseband processor 13 to the controller 21 in HCI packets.

A mobile phone portion 20 includes the controller 21, a memory 22, a keypad 23, a display 24, a voice processor 25, and an RF module 26. The controller 21 provides overall control to the mobile phone. The RF module 26 transmits/receives voice data and control data under the control of the controller 21. The voice processor 25 converts voice data received from the RF module 26 to an audible sound and outputs the audible sound through a speaker under the control of the controller 21. The voice processor 25 also converts a voice signal received from a microphone to voice data and outputs the voice data to the RF module 26 under the control of the controller 21. The keypad 23 includes a plurality of digit keys and function keys and outputs key input data corresponding to a key pressed by a user to the controller 21. The display 24 displays messages under the control of the controller 21. The memory 22 has a program memory for storing key input data required for control of the operation of the mobile phone according to the present invention and program data and a data memory for storing control data and data generated during user-related operations.

As described above, the mobile phone equipped with a Bluetooth module can communicate SMS message or service information including Internet data received from a mobile communication system by Bluetooth wireless communication between a master and a slave.

FIG. 4 is a flowchart illustrating a control operation for providing mobile

communication services to a Bluetooth device according to the present invention.

Referring to FIGs. 1 through 4, an operation for providing mobile communication services to a Bluetooth device will be described in detail.

5

It is assumed here that the master (mobile phone) and a slave have performed an inquiry process according the Bluetooth protocol. Hereinafter, a method of providing mobile communication services to a Bluetooth device from the master using Bluetooth according to the present invention will be described.

10

Upon receipt of service information such as an SMS message through the RF module 26, the controller 21 of the mobile phone controls the Bluetooth module 10 to transmit the service information to the slave. More specifically, upon receipt of SMS services including broadcasting information services and

15 on-demand information services through the RF module 26, the controller 21 stores data of the received information services in the memory. The controller 21 then transmits the received information services or user-created messages desired by the Bluetooth slave to the slave through the Bluetooth module 10.

20 Now referring to FIG. 4, the controller 21 of the mobile phone receives service information from a mobile communication system and stores the received service information in the memory in step 100. The mobile phone may also receive Internet information services. When the master desires to transmit the service information to the slave or the slave transmits a request for information

sharing to the master, the controller 21 of the master transmits predetermined service information data to the slave. A user of the master may also transmit user-created messages to the slave. The controller 21 of the mobile phone determines whether there is data to be transmitted to the slave in step 110. Step

5 110 may be performed by determining whether there is a request for data transmission to the slave of the master or a request for data reception from the master of the slave. The controller 21 performs corresponding functions if there is no data to be transmitted to the slave.

10 If there is a request for transmission of data received or input through the mobile phone as the master to the slave, the controller 21 converts data packets to be transmitted to the slave into HCI packets suitable for the Bluetooth protocol and transmits the HCI packets to the baseband processor 12 and the link controller 14 of the Bluetooth module 21 in step 130. In step 140, the baseband

15 processor 13 and the link controller 14 of the Bluetooth module 21 are connected to the slave through HCI to transmit and receive HCI packets. The slave that receives information data from the master may be predetermined or selected by the master.

20 Thus, the mobile phone can transmit data of the information services received from the mobile communication system or user-created data to the slave by converting it into a data format suitable for the Bluetooth protocol.

While the invention has been shown and described with reference to a

certain preferred embodiment thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention.

5 **[EFFECTS OF THE INVENTION]**

In accordance with the present invention, a mobile phone equipped with a Bluetooth module can share service information received from a mobile communication with other Bluetooth units in a Bluetooth system by Bluetooth wireless communication between a master and slaves.

10

1.   A method of sharing information with a slave by Bluetooth wireless communication in a portable phone that is connected with the slave by Bluetooth wireless communication and equipped with a Bluetooth module as a

5   master, comprising the steps of:

receiving service information from a mobile communication system and storing the received data;

determining whether to transmit the service information to the slave by Bluetooth wireless communication;

10   converting data packets of the service information to Host Control Interface (HCI) packets; and

transmitting the HCI packets to the slave.

2.   The method of claim 1, wherein the service information includes

15   SMS (short Message Service) message service information and Internet service information.

3.   A method of sharing information with a slave by Bluetooth wireless communication in a portable phone that is connected with the slave by

20   Bluetooth wireless communication and equipped with a Bluetooth module as a master, comprising the steps of:

a user inputting predetermined message information;

determining whether to transmit the message information to the slave by Bluetooth wireless communication;

converting data packets of the message information to Host Control Interface (HCI) packets; and

transmitting the HCI packets to the slave.

5   4.   The method of claim 3, wherein the predetermined message information can be edited by the user.

5.   A method of sharing information in a Bluetooth system including a master and a slave connected with each other by Bluetooth wireless 10 communication, comprising the steps of:

receiving service information from a mobile communication system;

a user inputting predetermined message information;

determining whether to transmit one selected from the service information and the message information to the slave by Bluetooth wireless 15 communication;

converting data packets of the selected information to Host Control Interface (HCI) packets; and

transmitting the HCI packets to the slave.

20   6.   The method of claim 5, wherein the service information includes SMS (short Message Service) message service information and Internet service information.

7.   The method of claim 5, wherein the predetermined message

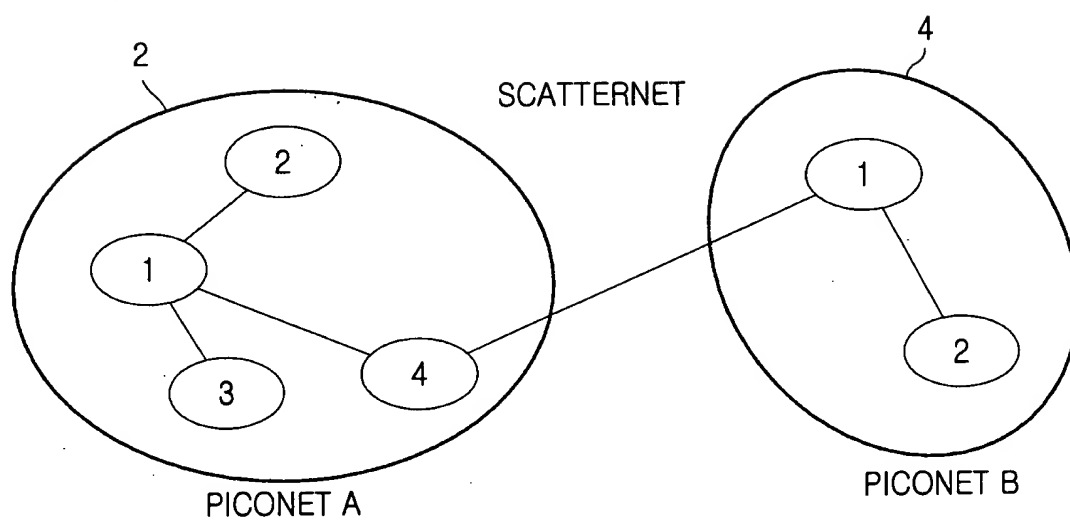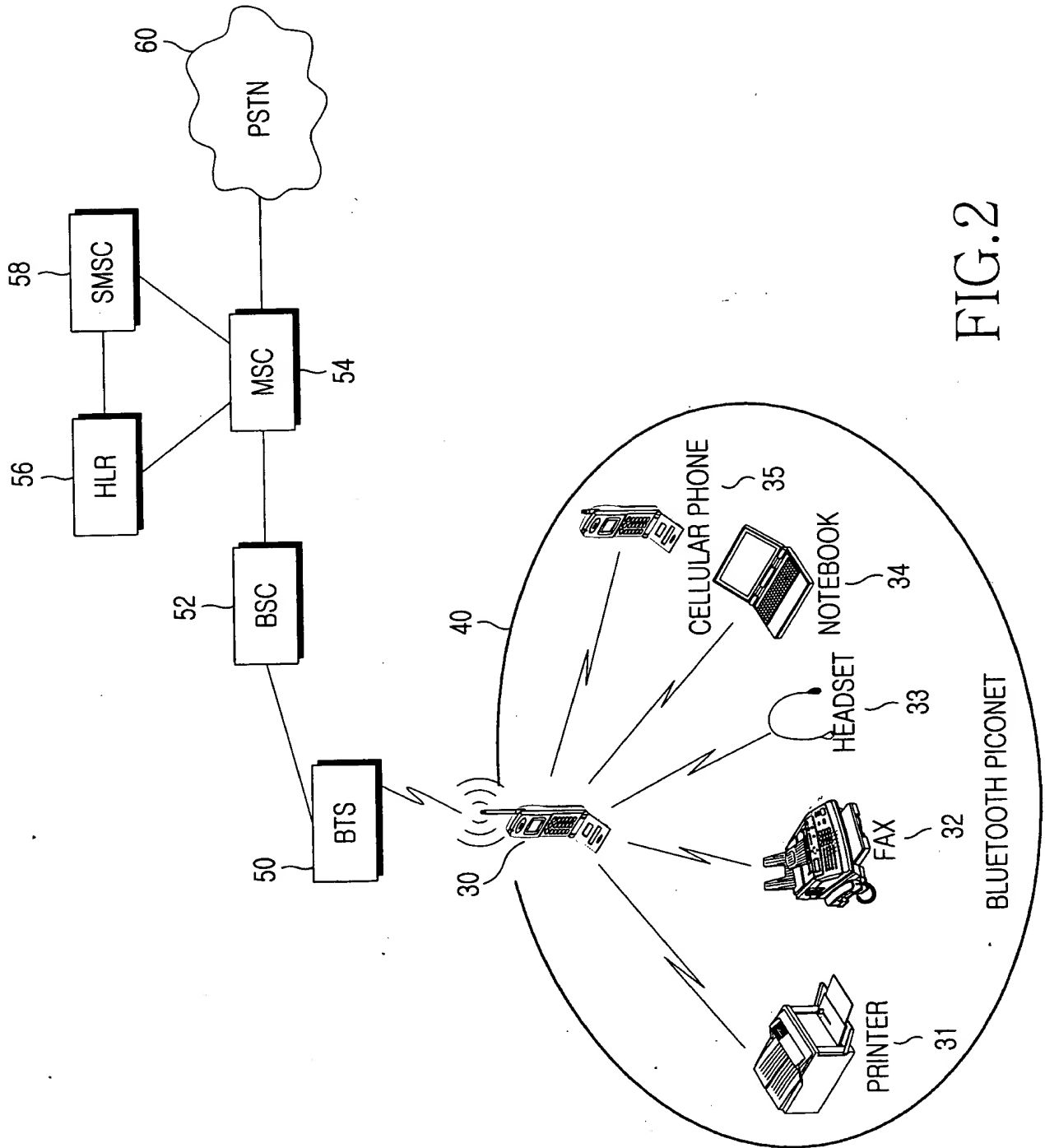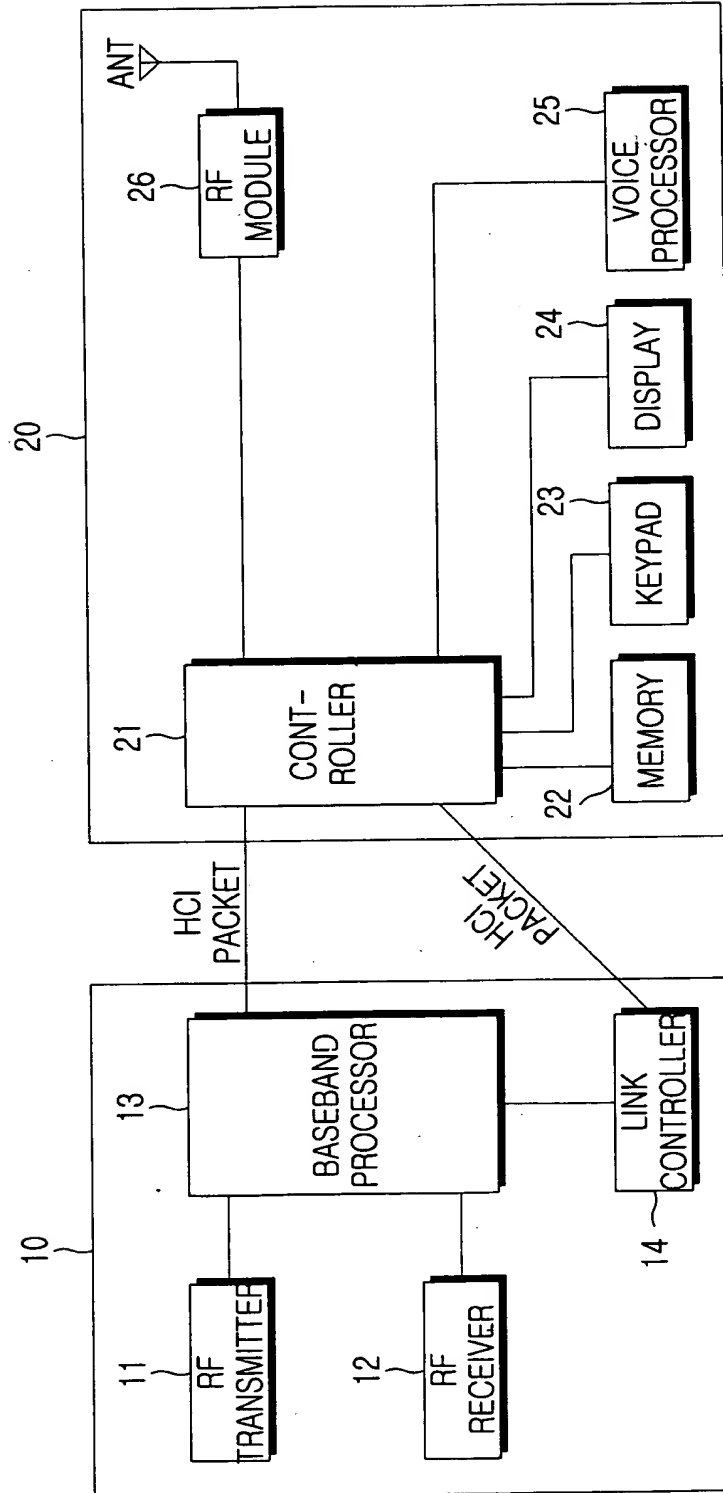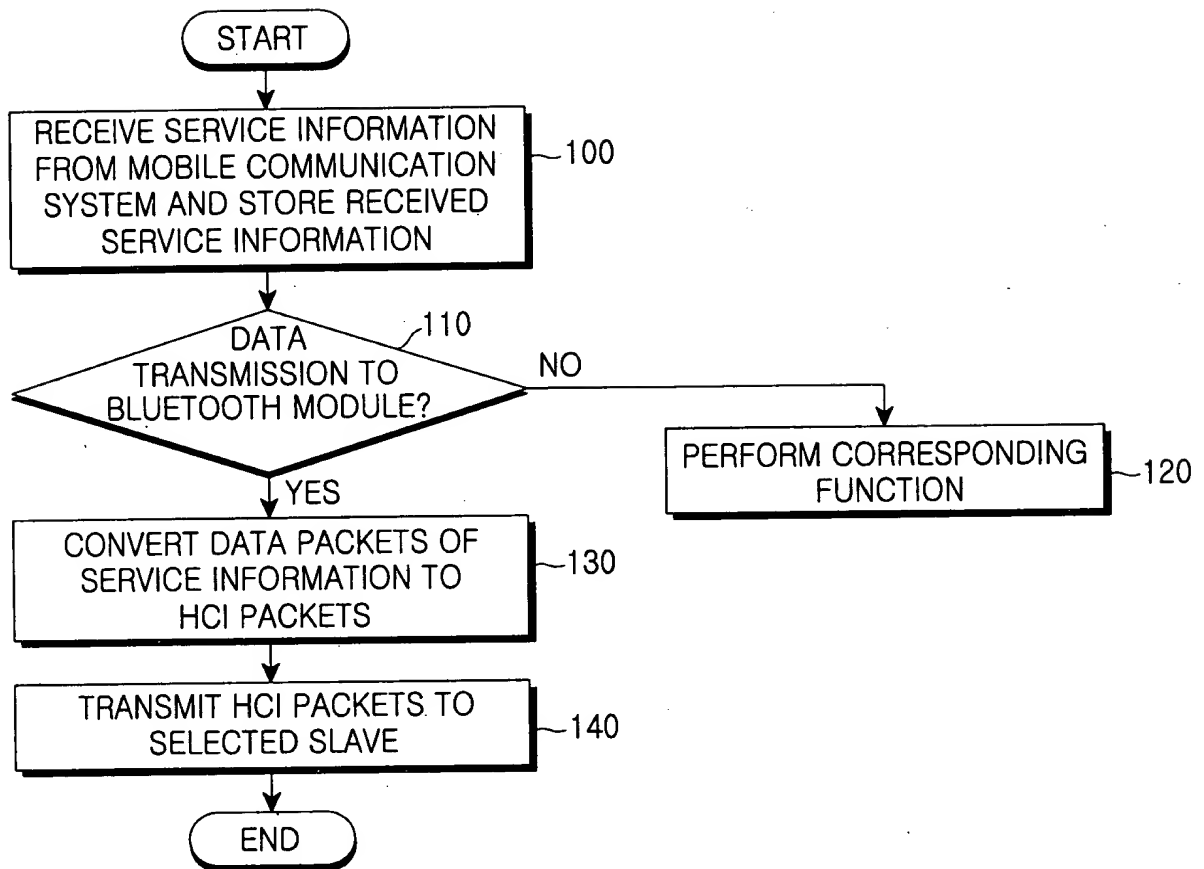information can be edited by the user.

FIG.1

FIG.2

FIG.3

START

RECEIVE SERVICE INFORMATION
FROM MOBILE COMMUNICATION
SYSTEM AND STORE RECEIVED
SERVICE INFORMATION
— 100

DATA
TRANSMISSION TO
BLUETOOTH MODULE? — 110

NO → PERFORM CORRESPONDING
FUNCTION — 120

YES

CONVERT DATA PACKETS OF
SERVICE INFORMATION TO
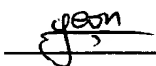HCI PACKETS
— 130

TRANSMIT HCI PACKETS TO
SELECTED SLAVE — 140

END

FIG.4

CERTIFICATION FOR TRANSLATION

As a below named translator, I hereby declare that my residence and citizenship are as stated below next to my name and I hereby certify that I am conversant with both the English and Korean languages and the document enclosed herewith is a true English translation of a priority document with respect to the Korean patent application No. **20653/2001** filed on **April 18, 2001.**

NAME OF THE TRANSLATOR : Yeon-Ji KIM

SIGNATURE : _____   **Date** : June 1, 2001

RESIDENCE : MIHWA BLDG., 110-2, MYONGRYUN-DONG 4-GA, CHONGRO-GU, SEOUL 110-524, KOREA

CITIZENSHIP : REPUBLIC OF KOREA

[ABSTRACT OF THE DISCLOSUSRE]

[ABSTRACT]

Disclosed is an information sharing method by Bluetooth wireless communication. To share information with a slave by Bluetooth wireless communication, a portable phone connected to the salve by Bluetooth wireless communication and equipped with a Bluetooth module as a master receives data from a mobile communication system and stores the received data. The portable phone determines whether to transmit the data to the slave by Bluetooth wireless communication. If the data is to be transmitted to the slave, the portable phone converts the data to a data packet for Bluetooth communication and determines whether the portable phone is connected to the slave by an ACL (Asynchronous ConnectionLess) link or an SCO (Synchronous Connection-Oriented) link. If the ACL link is connected between the portable phone and the slave, another ACL link is established and the portable phone transmits the data packet to the slave on the established ACL link. If the SCO link is connected between the portable phone and the slave, an ACL link is established and the portable phone transmits the data packet to the slave on the established ACL link.

[REPRESENTATIVE FIGURE]

FIGURE 6

[INDEX]

Bluetooth, Master, Slave

[SPECIFICATION]

[TITLE OF THE INVENTION]

METHOD OF SHARING INFORMATION BY BLUETOOTH

5 WIRELESS COMMUNICATION

[BRIEF DESCRIPTION OF THE DRAWINGS]

FIG. 1 illustrates the network configuration of a Bluetooth system to which the present invention is applied.

10 FIG. 2 illustrates a Bluetooth system receiving mobile communication services according to an embodiment of the present invention.

FIG. 3 illustrates the format of packets used in Bluetooth communication according to the present invention.

FIG. 4 illustrates mixed links between a master and slaves in Bluetooth

15 communication.

FIG. 5 is a block diagram of a mobile phone having a Bluetooth module according to the embodiment of the present invention.

FIG. 6 is a flowchart illustrating a control operation for transmitting data received from a mobile communication system to a slave by Bluetooth

20 communication in a master according to the present invention.

FIG. 7 is a flowchart illustrating a control operation for transmitting data received from the master to another slave by Bluetooth communication in a slave according to the present invention.

The present invention relates generally to a Bluetooth terminal, and in

5 particular, to a Bluetooth terminal receiving mobile communication service.

Bluetooth is a global de facto standard for wireless connectivity between mobile devices such as portable PCs and mobile phones. Based on a low-cost, short-range radio link, Bluetooth cuts the cords that used to tie up digital devices

10 to communicate voice and data. For example, a Bluetooth equipped mobile phone and laptop can establish a wireless connection together. Bluetooth is likely to be standard in PDAs (Personal Digital Assistants), desktops, facsimiles, keyboards, joysticks and a whole range of other digital devices.

15 As shown in FIG. 1, a Bluetooth system supports a point-to-point or point-to-multipoint connection. A set of devices sharing a channel should also share capacity. This device set is called a piconet. The piconet is defined as a small ad hoc network created when two or more Bluetooth-compatible devices recognize and communicate with each other. Seven Bluetooth units form a

20 piconet with one unit acting as a master and the others acting as slaves. The master manages the piconet including generation of a frequency hopping pattern.

When no connection is established between Bluetooth units, this is called a standby state. In the standby state, each Bluetooth unit receives a new

message every 1.28sec. Upon receipt of a connection request, a Bluetooth unit becomes a master and then starts to recognize other Bluetooth units. Bluetooth units, assigned to 8-bit park addresses, are in a park state. Bluetooth units communicating with the master, if they receive 3-bit active addresses, form a

5   piconet. Among eight addresses representable with three bits, one is used to a broadcasting address and the other addresses are assigned to seven Bluetooth units. Thus, seven Bluetooth units form a piconet. The Bluetooth units in the active state can be divided into three modes: active mode, hold mode, and sniff mode (lower power than in the active mode). Bluetooth units in the hold mode

10   and the sniff mode participate in forming the piconet but have no influence on the total traffic. The master transmits an inquiry including a link key at every 625μs intervals and synchronizes with slaves within two seconds. The slaves are assigned to 3-bit active addresses and after receiving a page message from the master, they are synchronized with the master using a hopping pattern

15   determined by the master. Then, an authentication process follows. An encryption key for authentication is formed by XOR-gating a random number generated from the master the MAC address of a slave. After the authentication, a data transmission state is entered.

20   The master controls all traffic on a channel. A plurality of independent and asynchronous piconets form a scatternet. Users of each piconet has a 1-MHz hop channel in the scatter net. Because the 1-MHz channel is not shared with other piconet units, the total throughput is increased as a piconet is added. In the scatternet, a Bluetooth unit can be act as a slave in one piconet and as a

master in another piconet.

[SUBSTANTIAL MATTER OF THE INVENTION]

While there exists message transmission technology for information

5 sharing from a master to slaves in the Bluetooth function, a general mobile phone,

that is, a terminal receiving a mobile communication service cannot retransmit,

for example, an SMS message. In other words, information can be shared

between Bluetooth terminals, but it is impossible to retransmit a message for a

mobile communication service.

10

It is, therefore, an object of the present invention to provide a method of

exchanging information received from a mobile communication system between

Bluetooth terminals.

15 **[CONSTRUCTION AND OPERATION OF THE INVENTION]**

To achieve the above and other objects, there is provided an information

sharing method by Bluetooth wireless communication. To share information

with a slave by Bluetooth wireless communication, a portable phone equipped

with a Bluetooth module as a master receives data from a mobile communication

20 system and stores the received data. The portable phone determines whether to

transmit the data to the slave by Bluetooth wireless communication. If the data

is to be transmitted to the slave, the portable phone converts the data to a data

packet for Bluetooth communication and determines whether the portable phone

is connected to the slave by an ACL (Asynchronous ConnectionLess) link or an

SCO (Synchronous Connection-Oriented) link. If the ACL link is connected between the portable phone and the slave, another ACL link is established and the portable phone transmits the data packet to the slave on the established ACL link. If the SCO link is connected between the portable phone and the slave, an

5 ACL link is established and the portable phone transmits the data packet to the slave on the established ACL link.

A preferred embodiment of the present invention will be described herein below with reference to the accompanying drawings. In the following description,

10 well-known functions or constructions are not described in detail since they would obscure the invention in unnecessary detail.

FIG. 2 illustrates a Bluetooth system receiving mobile communication services according to an embodiment of the present invention. While a CDMA

15 system is described as a mobile communication system, it is obvious to those skilled in the art that the present invention is also applicable to other communication systems including GSM.

Referring to FIG. 2, an SMSC (Short Message Service Center) 58 is an

20 independent node connected between an HLR (Home Location Register) 56 and an MSC (Mobile Switching Center) 54, for locating a receiver and transmitting SMS messages to mobile subscribers through the PLMN (Public Land Mobile Network). The SMSC 58 exchanges digits and characters between multiple character transmission systems including a PC communication system, an

Internet server system, and mobile phones and subscriber. The SMSC 58 is connected to another network through an SMC (Short Message Client: not shown).

5   The MSC 54 interacts with another MSC to process a call origination/termination request from a mobile phone 30. The MSC 54 refers to the HLR 56 for information about subscribers and, when an SMS message is received from the SMSC 58, it transmits the SMS message to a BSC (Base Station Controller) 52 so that the SMS message can be transmitted through a
10 BTS (Base Transceiver Station) 50 via a paging channel. Message reception is performed in the reverse order in the same manner. The HLR 56 is a medium-level computer mainly processing subscriber information. The HLR 56 is largely divided into a network connection device, a subscriber database, and an operation management device. The BSC 52 controls a wireless link and a wired
15 link and performs a handoff not to interrupt a call for a subscriber while he is roaming. The BTS 50 communicates wirelessly with the mobile phone 30.

The mobile phone 30 acts as a master in a Bluetooth piconet and exchanges SMS messages or Internet data. As stated before, the mobile phone
20 30 can be at once a master in one piconet and a slave in another piconet. A master controls all traffic on a channel and secures slots to assign capacity to an SCO (Synchronous Connection-Oriented) link. Only when its AMC address is set in a master-to-slave slot, a slave can transmit in a slave-to-master slot. A master-to-slave packet selects a slave. That is, a traffic packet transmitted to

one slave automatically another slave. If the master has no information to a slave, it cannot use a packet selecting a slave. This packet is comprised of an access code and a header. This central polling scheme removes contention between slave transmissions.

5

FIG. 3 illustrates a packet format used for Bluetooth communication according to the present invention. Data is transmitted in packets on a piconet channel. Referring to FIG. 3, each packet 70 includes three entities: an access code 72, a header 74, and a payload 76. The access code 72 and the header 74

10 are of fixed lengths, 72 and 54 bits, respectively. The payload 76 ranges between 0 to 2745 bits.

The access code 72 first comes in the packet 70. If the header 74 follows, the access code 72 is 72 bits and in the absence of the header 74, the

15 access code 72 is 68 bits. The access code 72 is used for synchronization, DC offset compensation, and identification. The access code 72 identifies packets transmitted on a channel in a piconet. All packets within an identical piconet have the same channel access code at the heads. The packet header 74 includes link control information. The payload 76 has two fields: a synchronous voice

20 field and an asynchronous data field. An ACL (Asynchronous ConnectionLess) packet has only a data field, and an SCO packet has only a voice field.

FIG. 4 illustrates an example of mixed link between a master and slaved in Bluetooth communication.

Referring to FIG. 4, a master communicates with slave #1 on an SCO link and with slave #2 on an ACL link. The SCO link selects usually a symmetrical circuit switching scheme for voice and supports a point-to-point communication between a master and a single slave. The ACL link selects a symmetrical/asymmetrical packet switching scheme for transmission of burst data and supports a point-to-multipoint communication between a master and all slaves. The master uses polling to control ACL communication. An SCO connection is symmetrical and typically supports voice transmission with time boundaries. SCO packets are transmitted for a reserved period. Once a connection is established, the master and a slave exchange SCO packets without being polled. An ACL connection is packet-oriented and supports both symmetrical transmission and asymmetrical transmission. The master controls a link band and determines as to how much piconet band is to be assigned to each slave and whether symmetry is to be provided to transmission. Slaves should be polled before data is transmitted.

In FIG. 4, since the master communicates with slave #1 on the SCO link, SCO packets are exchanged for reserved symmetrical periods, and since the master communicates with slave #2 on the ACL link, ACL packets are exchanged for asymmetrical periods without SCO packets.

FIG. 5 is a block diagram of a mobile phone with a Bluetooth module according to the embodiment of the present invention.

Referring to FIG. 5, a Bluetooth module 10 includes an RF (Radio Frequency) transmitter 11, an RF receiver 12, a baseband processor 13, and a link controller 14. The baseband processor 13 and the link controller 14 are

5 connected to a mobile phone controller 21 via an HCI (Host Control Interface), for exchanging control commands and user data in HCI packets. HCI packets include command, event, and data packets.

The RF transmitter 11 modulates radio data received from the baseband

10 processor 13 in a particular frequency band and amplifies the modulated signal prior to transmission. The RF receiver 12 receives an RF signal, amplifies a signal in a predetermined frequency band while suppressing amplification of the noise of the frequency signal, and downconverts the frequency of the amplified signal to a base band.

15

The baseband processor 13 converts a data packet received from the controller 21 to a packet suitable for Bluetooth communication by adding an access code and a header to the data packet, converts the Bluetooth packet to a predetermined data packet for wireless communication, and transmits the data

20 packet in a predetermined frequency band through the RF transmitter 11. The baseband processor 13 also converts a data packet received from the RF receiver 12 to an HCI packet and feeds the HCI packet to the controller 21.

The link controller 14 controls the Bluetooth module 10 based on a

command packet received from the controller 21 and transmits a request from a master and result information received from the baseband processor 13 to the controller 21 in HCI packets.

5   A mobile phone portion 20 includes the controller 21, a memory 22, a keypad 23, a display 24, a voice processor 25, and an RF module 26. The controller 21 provides overall control to the mobile phone. The RF module 26 transmits/receives voice data and control data under the control of the controller 21. The voice processor 25 converts voice data received from the RF module 10 26 to an audible sound and outputs the audible sound through a speaker under the control of the controller 21. The voice processor 25 also converts a voice signal received from a microphone to voice data and outputs the voice data to the RF module 26 under the control of the controller 21. The keypad 23 includes a plurality of digit keys and function keys and outputs key input data 15 corresponding to a key pressed by a user to the controller 21. The display 24 displays messages under the control of the controller 21. The memory 22 has a program memory for storing key input data required for control of the operation of the mobile phone according to the present invention and program data and a data memory for storing control data and data generated during user-related 20 operations.

As described above, the mobile phone equipped with a Bluetooth module can communicate SMS message or service information including Internet data received from a mobile communication system by Bluetooth wireless

communication between a master and a slave.

FIG. 6 is a flowchart illustrating a control operation for transmitting data received from a mobile communication system to a slave in a master by Bluetooth communication according to the present invention. It is assumed here that the master (mobile phone) and a slave have performed an inquiry process according the Bluetooth protocol. Upon receipt of an SMS message or Internet data through the RF module 26, the controller 21 of the mobile phone stores the received data in the memory 22. If the mobile phone is registered for Bluetooth information sharing, the controller 21 transmits the stored data to the Bluetooth module 10. Then, the baseband processor 13 of the Bluetooth module 10 converts the data to a data packet for Bluetooth communication and transmits the data packet to the slave through the RF transmitter 11.

Now referring to FIG. 6, the controller 21 of the mobile phone receives an SMS message or Internet data from a mobile communication system and stores the received data in the memory 22 in step 110. In step 112, the controller 21 checks whether the mobile phone is registered for Bluetooth information sharing. Bluetooth information sharing can be registered by the user of the mobile phone so that the mobile phone as a master can transmit all received data to a slave in a piconet through the Bluetooth module. If the mobile phone is registered for Bluetooth information sharing, the controller 21 transmits the received data to the Bluetooth module 10 in step 116. The baseband processor 13 of the Bluetooth module 10 converts the received data to a

data packet in the format shown in FIG. 3 for Bluetooth communication in step 118.

In step 120, the baseband processor 13 checks whether a physical channel has been established between the master and a slave, that is, whether a channel has been established on an ACL link or an SCO link between the master and a slave. If an ACL link exists between the master and the slave, another ACL is established between the master and the other slaves in step 122. Referring to FIG. 4, even if the ACL link is connected between the master and slave #2, another ACL link is established between the master and slave #1. If a channel exists on an SCO link between the master and a slave, an ACL link is established between the master and the other slaves in step 126. In steps 124 and 128, the baseband processor 13 transmits the data to the slaves.

FIG. 7 is a flowchart illustrating a control operation for transmitting data received from a master to another slave by Bluetooth communication in a slave according to the present invention.

A slave can act as a master and has the structure of the mobile phone shown in FIG. 5. As stated before, it is possible that a slave in one piconet acts as a master in another piconet in a scatternet. In this case, the slave can transmit received data to a lower slave. According to the present invention, the slave can transmit the received data automatically without a user command.

More specifically, upon receipt of an SMS message or Internet data from a master through the Bluetooth module 10, the controller 21 stores the received data in the memory 22. If the mobile phone is a master in another piconet and is registered for automatic transmission to another slave, the mobile phone 5 transmits the data to the slave.

Referring to FIG. 7, upon receipt of an SMS message or Internet data from a master through the Bluetooth module 10, the controller 21 stores the received data in the memory 22 in step 210. The controller 21 determines 10 whether the mobile phone is a master in another piconet in step 212. If the mobile phone is a master, the controller 21 checks whether the mobile phone is registered for automatic retransmission in step 216. If the automatic retransmission function is registered, the controller 21 transmits the received data to the Bluetooth module 10. Then, the baseband processor 13 of the Bluetooth 15 module 10 checks whether a physical channel has been established between the master and a slave, that is, whether a channel has been established on an ACL link or an SCO link between the master and a slave in step 220. If an ACL link exists between the master and the slave, another ACL is established between the master and other slaves in step 222. If a channel exists on an SCO link between 20 the master and a slave, an ACL link is established between the master and other slaves in step 226. In steps 224 and 228, the baseband processor 13 transmits the data to the plurality of slaves.

While the invention has been shown and described with reference to a

certain preferred embodiment thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention.

5 [EFFECTS OF THE INVENTION]

In accordance with the present invention, a mobile phone equipped with a Bluetooth module can share service information received from a mobile communication with other Bluetooth units in a Bluetooth system by Bluetooth wireless communication between a master and slaves.

10

[PATENT CLAIMS]

1.   A method of sharing information with a slave by Bluetooth wireless communication in a portable phone that is connected with the slave by Bluetooth wireless communication and equipped with a Bluetooth module as a

5   master, comprising the steps of:

receiving data from a mobile communication system and storing the received data;

determining whether to transmit the data to the slave by Bluetooth wireless communication;

10   converting the data to a data packet for Bluetooth communication when the data is to be transmitted to the slave;

determining whether the master is connected to the slave by an ACL (Asynchronous ConnectionLess) link or an SCO (Synchronous Connection-Oriented) link;

15   establishing another ACL link and transmitting the data packet to the slave on the established ACL link if the ACL link is connected between the master and the slave; and

establishing an ACL link and transmitting the data packet to the slave on the established ACL link if the SCO link is connected between the master and the

20   slave.

2.   The method of claim 1, wherein the data is an SMS (short Message Service) message.

3.   The method of claim 1, wherein the data is Internet data.

4.   A method of sharing information with a slave in a first piconet by Bluetooth wireless communication in a portable phone equipped with a
5   Bluetooth module that is a master in the first piconet and a slave in a second piconet, comprising the steps of:

receiving data from a master of the second piconet and storing the received data;

determining whether to transmit the data to the slave of the first piconet
10   by Bluetooth wireless communication;

determining whether the portable phone is connected to the slave of the first piconet by an ACL (Asynchronous ConnectionLess) link or an SCO (Synchronous Connection-Oriented) link when the data is transmitted to the slave of the first piconet;

15   establishing another ACL link and transmitting the data packet to the slave of the first piconet on the established ACL link if the ACL link is connected between the portable phone and the slave of the first piconet; and

establishing an ACL link and transmitting the data packet to the slave of the first piconet on the established ACL link if the SCO link is connected
20   between the portable phone and the slave of the first piconet.

5.   The method of claim 4, wherein the data is an SMS (short Message Service) message.

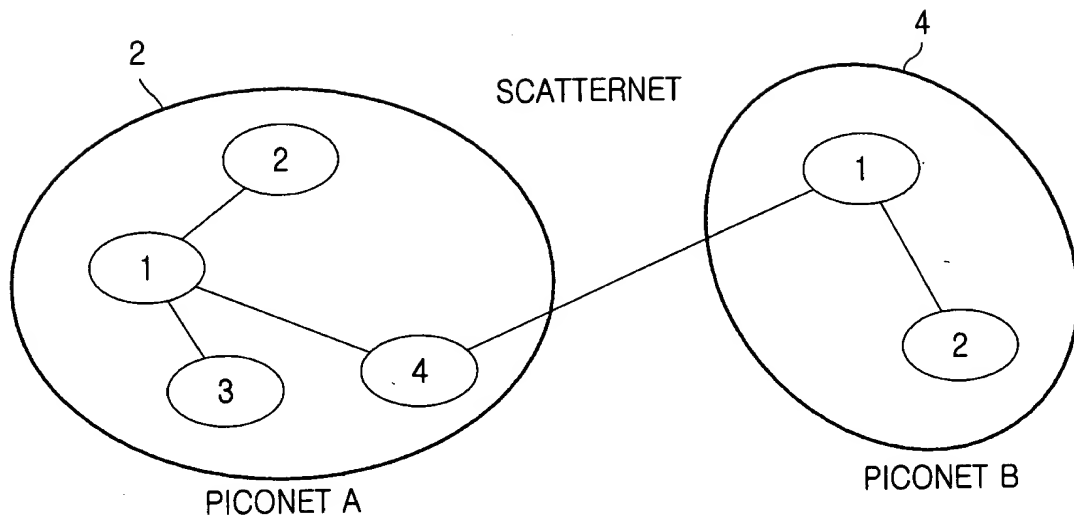6. The method of claim 4, wherein the data is Internet data.
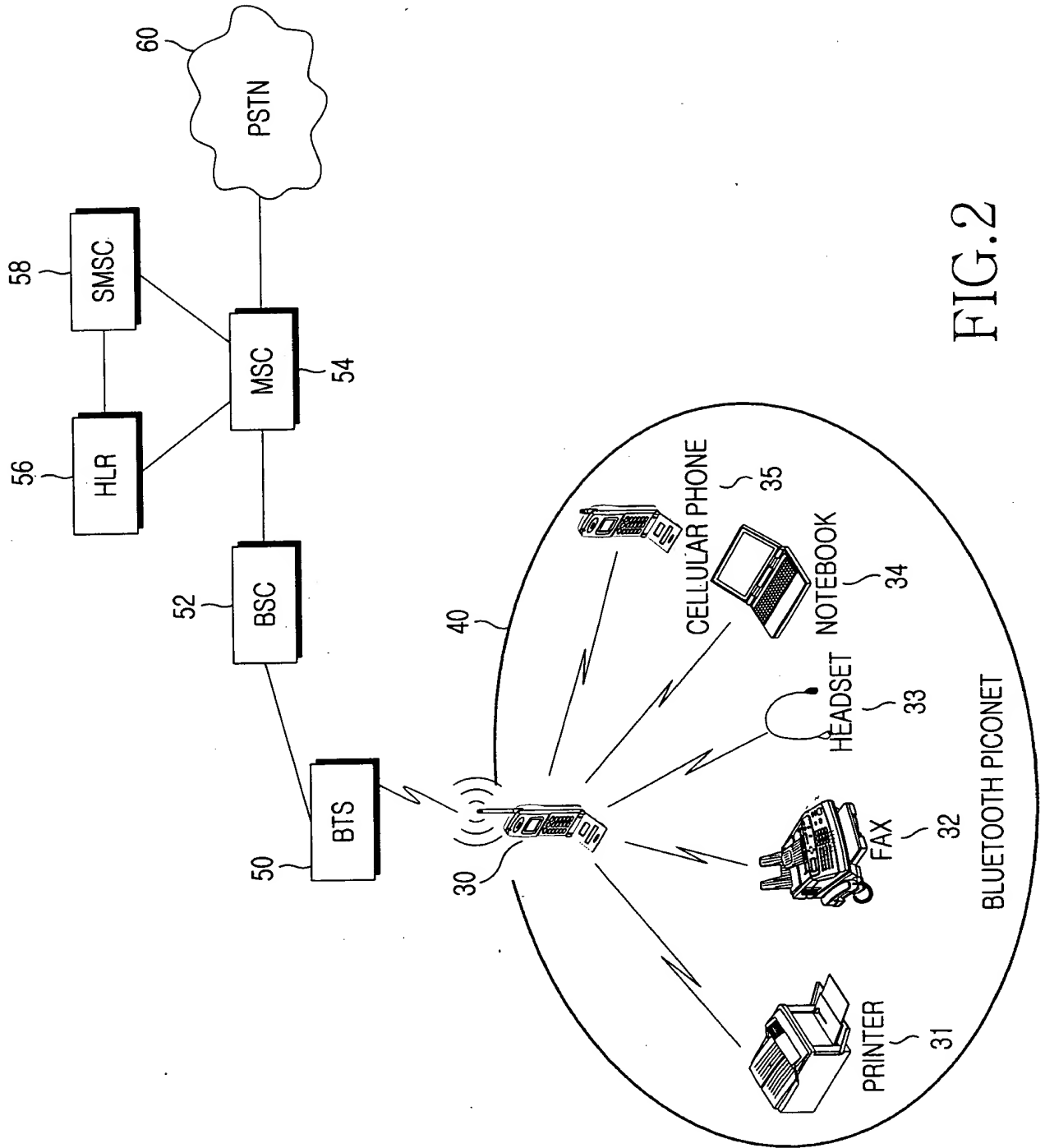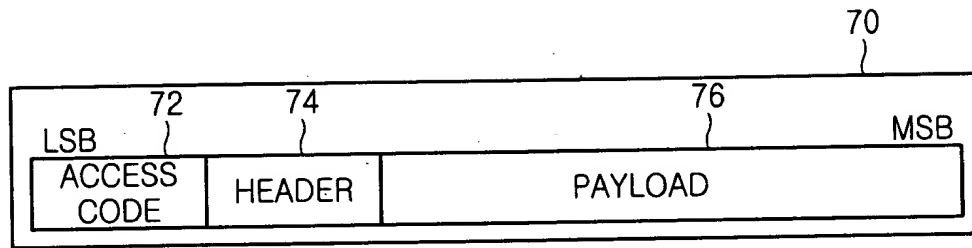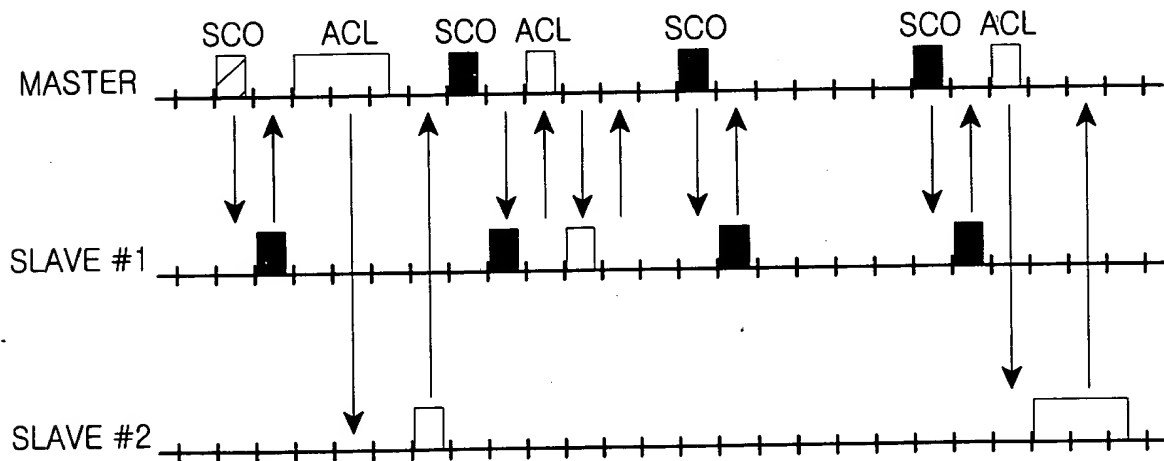
FIG.1

FIG.2

FIG.3

FIG.4

FIG.5

FIG.6

START

210 — RECEIVE DATA
FROM MASTER

212

MASTER? — NO → 214 NORMAL
OPERATION

YES

216

AUTOMATIC
RETRANSMISSION
REGISTERED? — NO → END

YES

220

ACL LINK
OR SCO LINK?

ACL   SCO

222 ESTABLISH ACL LINK
WITH SLAVES

226 ESTABLISH ACL LINK
WITH SLAVES

TRANSMIT DATA
TO SLAVES

TRANSMIT DATA
TO SLAVES

224   228

END

FIG.7